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ABSTRACT

This module on urinary tract infections is intended for use in inservice or continuing education programs for persons who administer medications in long-term care facilities. Instructor information, including teaching suggestions, and a listing of recommended audiovisual materials and their sources appear first. The module goal and objectives are then provided. A brief discussion follows of urinary tract infections, including a diagram of the urinary system; medications used for treatment; and considerations and suggestions for resident care. This discussion is intended for use as a lecture or participant reading. Other contents include a drug chart and a worksheet, both of which are suitable for reproduction for use as handouts. (YLB)

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URINARY TRACT INFECTIONS

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Urinary Tract Infections

Instructor Information

This material is intended for use in inservice or continuing education for persons who administer medications in long term care facilities. It includes:

- A brief discussion of Urinary Tract Infections and considerations for resident care; the discussion could be used as a lecture or provided to participants for reading.
- A vocabulary list which can be copied for distribution or written on a blackboard or large sheet of paper.
- A drug chart which can be copied and used as a handout for discussion.
- A worksheet which can be copied for completion by each participant. Completing the worksheet will help workers remember the material.

After using the components of this module in the above ways, discussion of the worksheet and of relevant situations in your own facility might be helpful.

Audio-Visual Aids

The following filmstrips and audio cassettes are available on loan from Vocational Education Services:

Physiology of the Kidney — describes function of the kidneys: filtration, reabsorption, PH regulation. AV070042

Urinary Care — identifies parts of urinary system, discusses catheters and demonstrates specimen collection. AV070035

Antibiotics — discusses action, side effects of several groups of antibiotics; also describes organism sensitivity and resistance. AV070032

Urinary Tract Infections

Goal

Due to anatomical changes of aging, patients and residents in long term care facilities experience a high rate of urinary tract infections for which medications are frequently prescribed. The goal of this module is to increase the participant's knowledge of and skill in caring for the person with a urinary tract infection, especially as related to medication administration and observation.

Objectives

After completing this module the participant will be able to:

- Recall the structure and function of the urinary tract
- Describe signs and symptoms of a urinary tract infection
- Name eight medications commonly used in the treatment of urinary tract infections, their actions and side effects
- Describe patient care measures which will aid in prevention and treatment of urinary tract infections.

General Information

The urinary tract has the important function of filtering waste products from the blood and discharging them from the body. The kidneys are responsible for the filtration process and, when functioning normally, they filter about one quart of blood per minute. Urea and other waste products are removed and electrolytes, blood cells and other important contents of the blood are retained by this complex filtration process. Wastes which are removed are diluted with water and drain through the ureters into the urinary bladder. The bladder collects the urine as it forms until it is emptied by the process of urination.

Infection can affect any part of the urinary system. Pyelonephritis (inflammation of the kidney) is caused by an infection. It may be associated with kidney stones, stroke, circulatory diseases and prolonged bed rest. Pyelonephritis may be acute or chronic. Symptoms include back pain, fever, gastrointestinal upset, burning on urination. A urinalysis may show pus, blood, or bacteria in the urine. Cystitis (inflammation of the bladder) is also caused by infection. It may be associated with diabetes, gout, enlarged prostate, and circulatory diseases. Poor hygiene increases the possibility of developing a bladder infection. A particular danger is the retention catheter which may permit bacteria to move along it into the bladder where an infection can result. Symptoms of cystitis include urinary frequency, painful urination, blood in the urine and fever. Urinalysis may discover pus, blood and bacteria in the urine.

Vocabulary

Increase your word power by learning the following definitions.

Pyelonephritis — inflammation of the kidney
Cystitis — inflammation of the bladder
Hematuria — blood in the urine
Dysuria — painful urination
Anuria — absence of urine production
Oliguria — scant urinary output
Crystalluria — formation of crystals in the urine
Photosensitivity — hypersensitivity of the skin to sunlight
Tinnitus — a sound in the ears such as ringing or buzzing
Ataxia — loss of muscle coordination

Care of the Resident With a Urinary Tract Infection

Considerations	Suggestions
Poor hygiene may contribute to urinary tract infection.	Carefully cleanse the perineal area daily and as needed. Care for the catheter carefully according to the schedule and procedure in your facility.
Organisms which cause UTIs are less viable in acid urine.	Encourage residents to drink cranberry juice, eat plums, prunes, peanut butter, and meat to acidify urine unless they are receiving a sulfa drug. Encourage resident to drink adequate fluids to flush urinary tract.
Organisms which commonly cause UTIs may cause acute septicemia.	Be alert for symptoms of acute septicemia such as fever, chills, hypotension, and report these immediately.

When Resident Is Receiving Medication

Medication may be chosen by culture and sensitivity studies.	Obtain uncontaminated specimen by method ordered.
UTIs respond to anti-infectives that are excreted in the urine.	Administer medication on schedule as ordered. Be aware that some medications cause discoloration of the urine. Encourage fluids.
Medication may be ordered for periods of 30 days or more.	Watch for undesirable effects of medication such as nausea, vomiting, hives, itching. Encourage patient to continue taking medication as ordered even after symptoms subside.
Medication action may be affected by acidity-alkalinity of the urine.	Check recommendations regarding the medication administered. Foods which may acidify urine are meat, plums, prunes, peanut butter, cranberry juice. Foods which may cause alkaline urine are citrus fruits, vegetables, milk products.

Medications Frequently Used for Urinary Tract Infections

Antibiotics

Anti-infective - Medication which kills or prevents growth of certain disease producing organisms.

Medication	Adverse Reactions	Reacts With	To Cause	Considerations
Ampicillin (Omnipen) (Amcill)	Nausea Vomiting Rash Hives Chills	**Erythromycin** **Tetracyclines**	Antagonistic action	Check for allergy reaction to penicillin; give 1-2 hours before or 2-3 hours after meals; bacterial or fungal superinfection may occur.
Cephalexin (Keflex)-oral (Keflin)-IM, IV	Dizziness Headache Nausea Vomiting Itching Rash Hives Genital pruritis Vaginitis	**Probenecid**	Increased blood levels of Keflex	Bacterial or fungal superinfection may occur; false reading on clinitest will occur — use tes-tape or clinistix.

Medications Frequently Used for Urinary Tract Infections

Sulfonamides

Anti-infective - Medication which kills or prevents growth of certain disease producing organisms.

Medication	Adverse Reactions	Reacts With	To Cause	Considerations
Co-trimoxazole (Bactrim) (Septra)	Headaches Dizziness Ataxia Tinnitus Nausea Vomiting Rash Itching Sore throat Fever Pallor	**Ammonium chloride** **Ascorbic acid** **Paraldehyde**	Crystalluria — Precipitation of sulfonamide	Have patient drink plenty of water to prevent crystalluria; do not attempt to acidify urine; give 1 hour before or 2 hours after meals. *Sulfonamides will crystalize in acid urine*
		PABA drugs (Sunburn protectants)	Inhibited antibacterial action	
Sulfasoxazole (Gantrisin) (Urizole)	Headache Ataxia Dizziness Insomnia Swelling around eyes Tinnitus Nausea Vomiting Hives Rash Photosensitivity	**Ammonium chloride** **Ascorbic acid** **Paraldehyde**	Crystalluria— Precipitation of sulfonamide	Do not attempt to acidify urine; encourage fluids to prevent crystalluria; avoid sunlight; watch for signs of GI superinfection.
		PABA drugs (sunburn protectants)	Inhibited antibacterial action	

continued below

Medications Frequently Used for Urinary Tract Infections

Anti-infective - Medication which kills or prevents growth of certain disease producing organisms.

Medication	Adverse Reactions	Reacts With	To Cause	Considerations
Sulfamethoxazole (Gantanol)	Headache Ataxia Dizziness Swelling around eyes Tinnitus Nausea Vomiting Rash Itching Sore throat Fever Pallor Photosensitivity	**Ammonium chloride** **Ascorbic acid**	Crystalluria—precipitation of sulfonamide	Encourage fluids to prevent crystalluria; avoid direct sunlight while receiving drug; do not attempt to acidify urine.
		PABA drugs (sunburn protectants)	Inhibited bacterial action	

Medications Frequently Used for Urinary Tract Infections

Urinary Antiseptics

Anti-infective - Medication which kills or prevents growth of certain disease producing organisms.

Medication	Adverse Reactions	Reacts With	To Cause	Considerations
Nitrofurantoin (Furadantin)	Headache Dizziness Dyspnea Nausea Vomiting Nystagmus Rash Hives Loss of hair Crystalluria Jaundice	**No significant reaction**		Give with food to decrease GI upset; store in amber container; rinse patient's mouth after taking liquid preparation to avoid staining teeth.
Methenamine (Mandelamine)	Rash GI upset	**Alkalyzing agents** **Acetazolmide** (Diamox)	Inhibited action Antagonistic effect	Works best in acid urine.
Nalidixic acid (Negram)	Headache Dizziness Visual problems Nausea Vomiting Rash Itch Photosensitivity	**Nitrofurantoin** (Furadantin)	Antagonistic effect	Encourage patient to stay out of sunlight; clinitest will not give correct reading—use Tes-tape or Clinistix.

Worksheet

Answer the following questions:

1. Two medications which will cause a false reading on Clinitest are _____ and _____.

2. Symptoms of a Urinary Tract Infection include:
   1. 3.
   2. 4.

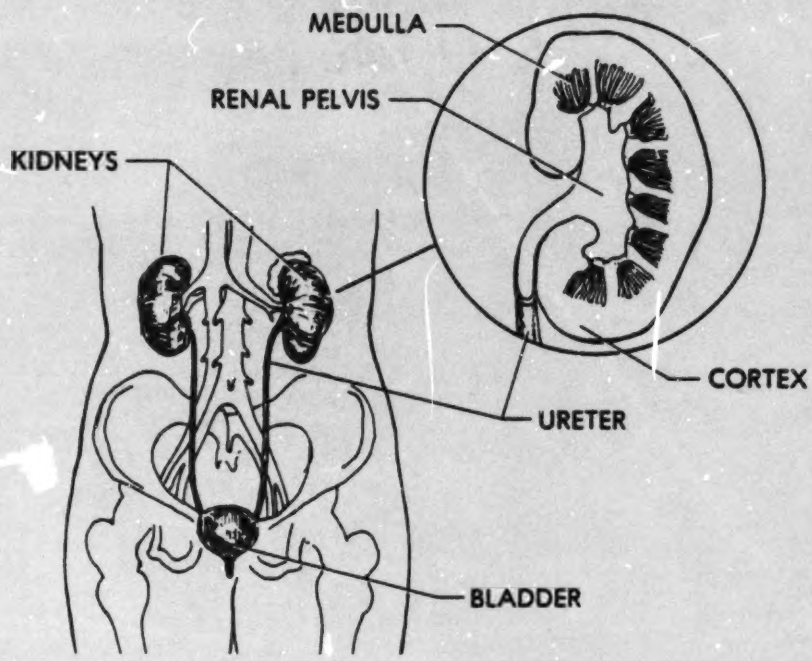
3. Undesirable effects of anti-infectives administered for a Urinary Tract Infection include:
   1. 4.
   2. 5.
   3. 6.

4. Measures which might help to prevent Urinary Tract Infections are:
   1.
   2.
   3.
   4.

Matching

____ 1. Dysuria	A. Inflammation of the kidney
____ 2. Anuria	B. Blood in the urine
____ 3. Hematuria	C. Crystals in the urine
____ 4. Cystitis	D. Inflammation of the bladder
____ 5. Oliguria	E. Absence of urine
____ 6. Crystalluria	F. Scant amount of urine
____ 7. Pyelonephritis	G. Painful urination
____ 8. Ataxia	H. Pus in the urine
____ 9. Tinnitus	I. Ringing in the ears
	J. Loss of muscle coordination

URINARY SYSTEM



FUNCTION

PRODUCE URINE

MAINTAIN HOMEOSTASIS

REMOVE WASTE FROM BLOOD STREAM

END

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